Name: Date:

The Diatom Game

OBJECTIVE:

- To introduce the two types of phytoplankton: diatoms and dinoflagellates.
- To explore the specific adaptations of the shapes of diatoms, which are effective in keeping some of them in the upper, sunlit area of the ocean.

ACTIVITIES:

Make paper diatoms and investigate how they travel.

Diatoms (Chaetoceros sp.)

BACKGROUND:

Phytoplankton are microscopic, single-celled plants that drift along with the ocean currents and tides. They are capable of photosynthesis and can only be found in the photic or sunlit part of the ocean. Phytoplankton are the base of all aquatic food chains and are also found in lakes, ponds, and rivers. The oceans produce 20 BILLION tons of phytoplankton per year-three times the amount produced by plants and trees on land. Phytoplankton produce 65-75% of the world's oxygen.

Phytoplankton are divided into two major groups: The diatoms, which make up 98% of the phytoplankton, and the dinoflagellates, which make up the remaining 2% Diatoms are unicellular plants that average from 0.05 mm to 0.5 mm in size. Diatoms can form chains of single cells and some have small projections extending from the plant to bolster the plant's ability to float. Diatoms are characterized by a transparent shell, which is made of silica (glass-like). This allows the plant to photosynthesize. Diatom shells have been collecting on the ocean floor for millions of years. In some areas the shells are mined and used in silver polishes, toothpaste, and as an abrasive agent in flea powder.

PROCEDURES:

1. Phytoplankton are autotrophs but they are very tiny-smaller than this dot (.). As autotrophs, they provide us with the oxygen we need. Some diatoms are more successful at staying in the upper sunlit part of the ocean, due to their shape and the ocean currents. Others are not as successful. With this activity, try to find out which diatom shapes are successful in keeping the diatom afloat.

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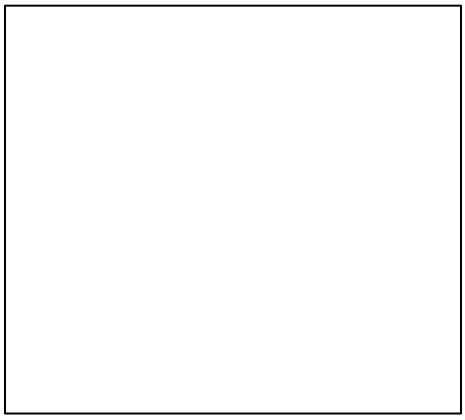
2. On the following page are several types of diatoms. The paper diatoms are 150 times larger than the real ones. Cut them out and drop them, one at a time, from the top of a set of stairs or other high place.
3. Describe how the diatom falls–does it spin or fall like a maple seed? How long does it take for each paper diatom to reach the floor? Use a stop-watch to measure the time. Why do some fall faster than others? Fill in the chart on page 3 as you go along with your activity.
4. Design your own diatom shape within the square provided. Make your model diatom out of tinfoil and place it in the aquarium. Time how long it stays afloat

Questions:

1. Which Diatom do you think will float for the longest time? Why?

2. Which Diatom do you think will float for the shortest time? Why?

Space to design your own diatom:

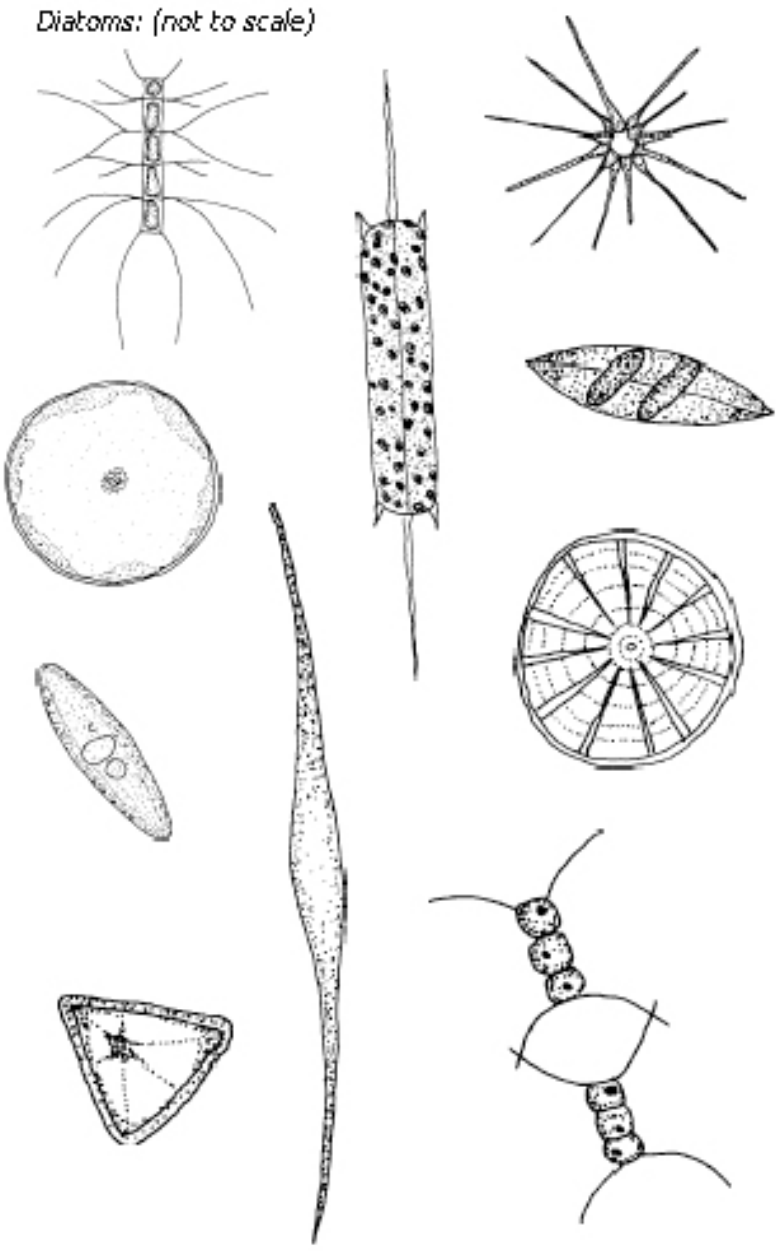


Diatom	*Time of Fall*	*Description of Descent*
1		
2		
3		
4		
5		
6		

2

7		
8		
9		
10		

Conclusion: Which Diatom was the most successful floater, which was the least successful? Why do you think this was?



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